

Eros PEDRONI
Appl. No.: 10/018,797

AMENDMENTS TO THE CLAIMS

15 (currently amended). An apparatus for treating a patient using proton therapy, comprising:

a proton beam guiding device employing magnets, quadrupoles, and an end-mounted proton beam guiding and control device with an exit window for guiding or directing the proton beam to the treatment spot in the patient;

a controllably movable patient table for moving the patient to the desired position relative to the proton beam, said table positioned over an immobile floor;

wherein the proton beam guiding and control device is located so as to be turnable or rotatable by turning or rotating less than a full 360° about a horizontal axis in such a way that there results a region through which the proton beam guiding and control device is not freely movable, in which region the patient table located in essentially the plane of the horizontal axis of rotation remains accessible from the side and the beam guiding and control device is arranged to be turnable or rotatable by at least 135° upwards and downwards from a horizontal plane running essentially through the horizontal axis of rotation; and

wherein the patient table is rotatable in a horizontal plane running essentially through the axis of rotation of the proton beam guiding device or parallel to it and displaced by a small deviation around an axis which runs essentially through the isocenter of the apparatus, which isocenter is formed by the intersection of the proton beam with the horizontal axis of rotation or with the intersection by approximation of the beam with the horizontal axis of rotation.

16. (canceled).

17. (previously added). Apparatus according to claim 15, wherein the beam guiding and control device is arranged to be rotatable about the horizontal axis of rotation from a vertical plane running essentially through the horizontal axis of rotation by an angle of 90° from the side of the vertical plane on which the patient table is located up to an angle of approximately 180° on the opposite side of the vertical plane.

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18. (previously amended). Apparatus according to claim 15, wherein the patient table is arranged to be rotatable or movable in the region of the horizontal plane through which the beam guiding and control device is not movable, or which region lies opposite another region through which the beam guiding and control device is movable.

19. (previously added). Apparatus according to claim 15, wherein the patient table is rotatable about an axis in an end-mounted region on the patient table.

20. (previously amended). Apparatus according to claim 15, wherein the patient table is arranged to be slidable or movable in its longitudinal axis.

21. (previously amended). Apparatus according to claim 15, wherein the patient table is designed to be additionally rotatable about an axis running vertically in essentially the center region of the table, to be movable in a direction transverse to the longitudinal axis, and also to be adjustable in height.

22. (previously added). Apparatus according to claim 15, further comprising a proton beam penetration depth adjustment device located in front of the apparatus before the magnets and quadrupoles, the proton beam penetration depth adjustment device comprising a system of plates or blades movable in or through the proton beam so as to control or restrict the energy and the associated penetration depth of the proton beam in the patient.

23. (previously added). Apparatus for treating a patient using proton therapy, comprising:

a proton beam guiding device employing magnets, quadrupoles, and an end-mounted proton beam guiding and control device with an exit window for directing the proton beam to the treatment spot in the patient;

a controllably movable patient table for moving the patient to the desired position relative to the proton beam;

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wherein the exit window or a covering housing which is end-mounted on the proton beam guiding and control device and forms the exit window, is provided which is movement-coupled with the patient table during treatment such that during treatment of the patient discrete movements effected by the patient table are synchronously reproduced by the exit window or covering housing.

24 (previously added). Apparatus according to claim 23, further comprising an additional control device for coupling the motion of the patient table with the exit window or covering housing during treatment of a patient.

25. (currently amended). A method for treating a patient using proton therapy, the method comprising:

directing a proton beam to a treatment spot in a patient using an apparatus comprising a proton beam guiding device employing magnets, quadrupoles, and an end-mounted proton beam guiding and control device with an exit window for guiding or directing the proton beam to the treatment spot in the patient, wherein the proton beam guiding and control device is located so as to be turnable or rotatable by turning or rotating less than a full 360° about a horizontal axis in such a way that there results a region through which the proton beam guiding and control device is not freely movable; and a controllable movable patient table positioned over an immobile floor for moving the patient to the desired position relative to the proton beam and the beam guiding and control device is arranged to be turnable or rotatable by at least 135° upwards and downwards from a horizontal plane running essentially through the horizontal axis of rotation; and

wherein the method includes positioning a person lying on the patient table by moving the patient table and proton beam guiding and control device of the apparatus such that the proton beam is directed to the treatment spot in the patient, and wherein the patient table remains accessible by way of said region at all times from one side.

26 (previously added). The method according to claim 25, wherein the moving includes positioning the proton beam guiding and control device and the patient table

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around one axis – the proton beam guiding and control device by turning or rotating about a horizontal axis of rotation and the patient table by turning in a horizontal plane running essentially through the horizontal axis of rotation or parallel to this and arranged so as to be displaced by small deviation – which one axis runs essentially through the isocenter of the apparatus, which isocenter is formed by the intersection of the proton beam with the axis of rotation or with the intersection by approximation of the beam with the axis of rotation.

27 (previously added). The method according to claim 25, further comprising controlling or restricting the energy, and associated with this, the penetration depth of the proton beam in the patient by means of a proton beam penetration adjustment device located in front of the apparatus before the magnets and quadrupoles, which adjustment device comprises a system of plates or blades movable in or through the proton beam.

28. (previously added). The method according to claim 25, wherein the treating includes destroying a malignant organ or tumor in a human body.